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AUTHOR Westbury, Ian
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ABSTRACT

The object of this paper is to show, on the one hand, how a concern for curricular problems inexorably leads one into the mechanics and dynamics of the classroom and, on the other hand, how a concern for the classroom without a concern for context poses the danger that the questions that will arise are, from the viewpoint of the schools, wrong questions. The intersection between curriculum and instruction is possible. Data from studies of classrooms and teaching indicate that the way teachers manage the delivery of coverage of content and the organization of instruction seem to affect student achievement. Methods of classsroom management that have the potential to improve instruction include programmed instruction, individualized instruction, and computer-assisted instruction. (Author/IRT)

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THE CURRICULUM AND THE FRAMES OF THE CLASSROOM

Ian Westbury

University of Illinois

at

Urbana-Champaign

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Paper presented to annual meeting of the American Educational Research Association, New York, April, 1977. In rewriting this second version of this paper I am grateful to our discussants, Arno A. Bellack, Teachers College, Columbus University and W. A. Reid, University of Birmingham for comments they offered on this paper.

EA 009 837

In this paper I will argue that curriculum research and curriculum theory must attend more systematically than they have to research on instruction. I see classroom events (i.e., instruction) as the embodiment of the curriculum and the nature of that embodiment and the kinds of control that might be exercised over it as the central issue of curriculum thought. However, it is not clear that current curricular or instructional research have in fact pursued the implications of such a viewpoint with the vigour that they might have: the classroom has been conventionally seen either separate from the curriculum, a place where a disembodied instruction takes place, or, alternatively, as either a neutral or a noisy channel in which curricular goals should be actualized. Both of these approaches to the classroom are problematic: to see instruction as unrelated to curriculum poses the danger that what is explored under the rubric of instructional research is trivial. To see the classroom as a place in which goals can simply and directly order instruction because ends-means relationships are transparent is to deny realities which are being increasingly widely recognized.

While the approaches to the classroom that I have sketched above are caricatures, there is enough truth in them to raise the possibility that the classroom has not been appropriately conceptualized. And if this is true to any degree whatsoever, it poses severe problems for the curriculum planner and the educational policy-maker: without an appropriate view of the classroom, we cannot plan for schools as they might exist, nor visualize alternatives that might enable us to pursue current goals more effectively, nor pursue new goals that we are, in our present state of knowledge, incapable of achieving. The question is, how might curriculum and instructional research and theory to equip themselves to meet the task that seem to be before them? We are in a time, we must remember when the educational viability and the instructional efficancy of present classroom arrangements are being questioned from a number of vantage points.

Within this context, the issue before curriculum studies is not the need to address the classroom and its methods, but rather the task of seeing that place and its procedures in terms that derive from a view of what the classroom might be. I propose to approach this problem in terms broadly derived from organizational theory and will follow Cusick et al (1976, p.3) assuming that "organizational structures are never neutral, but within . . .prescribed roles, decision-making processes, technology, patterns of communication and even in their unintended effects, [structures] create the situation in which participants develop their ways of behaving and believing." An assumption of this kind gives us, I believe, the terms we need to approach the task before us inasmuch as links ends and means in an appropriate way. But what it does not do is tell us what these linking topics (i.e., "roles", "processes," etc.) might mean as they relate to a real place and real phenomena.

There seem to be two general ways in which the kind of operationalization we need might be sought, one broadly sociological, the other technical. Where these approaches are discussed together, however, they are most often seen as competitive explantions with a preference being given to broader social factors (e.g. class, race). Such an expression of preferance does not seem necessary, however, inasmuch as there is no reason why the classroom cannot be seen as having two aspects; it is a place in which the world outside the school is mirrored but it is, at the same time, a contrived world in which forces which derive from the characteristics of the structures of teaching itself also operate. One, either, or both these forces can be operative at a given time, and in principle there is no reason to believe that misunderstandings and problems at the technical level cannot affect practices as much as do classificatory problems arising from biassing social presuppositions.

But let me assume that these introductory remarks are unexceptionable. Let me also assume that the possibility of an intersection between curriculum and instruction can also be taken as possible and attempt to put some force behand an assumption by citing some data from studies of classrooms and teaching that seem to have clear curricular implications.

First let us look at some data from studies of what happens in classrooms that might plausabily effect achievement. Filby, Marliave and Fisher (1977) report a study of six Grade 2 classrooms in which they found that the proportion of the day allocated for reading and reading-related instruction ranged was from 24 per cent 45 per cent: in mathematics the range was from 9 per cent to 20 per cent. They also observed the proportion of time students spent actively engaged in academic learning and for mathematics the class means ranged from 37 per cent to 74 per cent (see Table 1). Gump (1971) reported similar considerable variance in the time spent in different activites in six third grade classrooms (see Table 2) and, as he notes:

> Although the classrooms observed were in the same school system the variability in exposure to different concerns was rather impressive. The table also reveals differences in how much time pupils spent in particular categories of nonacademic concerns: one category of possible interest is the procedural one. There segments most probably represent 'educational losses'. They do not directly advance any curricular goal; they are preparations as closings-down: yet the average proportion of occupancy time here was rather high (p.182).

There is good reason to believe that differences in time spent in learning is an important factor accounting for differences in class achievement. Thus, there are an increasing number of studies which report significant associations between both the presence or absence of instruction on a given topic or item of content and the time spent in learning a topic and achievement. (Rosenshine, 1977

Let me describe one study which permits some direct inference about the effects of the time factor. Good et al (forthcoming) report that over an eighty day period they found that the teachers of a group of high achieving mathematics classrooms averaged 1.126 pages of textbook coverage per day while teachers of low achieving classrooms in their sample averaged only .710 pages per day.

Arlin and Westbury (1976) report another approach to the issues of classroom efficiency in their study of the effects of two different technologies of instruction on the learning per unit of time of students. They compared the learning rates of students in a simulated conventional classroom with learning rates in a classroom in which programmed materials were used as the medium of instruction. Their findings are set out in Figure 1 and clearly suggest that the modes of instruction in the PI setting were more efficient than those of the conventional setting. When a mastery regimen is added to a PI treatment (as it was in the study from which the results in Arlin and Westbury's study were derived, Arlin, 1973), the inefficiency of the conventional classroom is greater (see Figure 2).

Data of this kind suggest that there are differences in the ways in which teacher organize their classrooms for the purposes of academic instruction and if we focus for the moment both on the Good et al and our study it would seem as if these differences might matter in some significant ways: perhaps we can say that they suggest that the ways in which teachers manage the delivery of coverage of content and the organization of instruction seems to affect achievement.

The term manage is, I believe, critical to a discussion of the curricular aspects of instruction. We can generalize the use of the term beyond the instances I have been discussing and suggest, I believe, that teaching can in fact be seen as the management of the attention and time of students vis-a-vis the primary educational ends of the classroom. Different instructional methods achieve

different ends to different degrees and in different ways: thus, in our study, the crucial finding from the point of view being presented here is the possibility that PI permits students to adopt their own learning pace and, because they are able to do this, the potential pace of different students with different aptitudes can actualize itself without the impediment of the learning rate of other students.

The critical element in our study was the treatment (PI vs 'conventional instruction'): from the point I view I wish to develop here this difference can be seen in terms derived from both the notion of management and the notion of technology. PI is a new technology for the delivery of instruction to students, it brings instruction to them directly without the necessary mediation of the teacher whose instructional skill vis-a-vis individual students in the conventional classroom is modified by his/her need to also instruct all other students in his/her room. And while there are tasks and functions which are common to both of these settings their manifestations vary inasmuch as the different technologies present different instructional management situations to teachers.

This recognition of teaching as the management of instruction is an old insight -- but one that is being increasingly rediscovered (Rothkopf, 1968, 1976) As Currie (1884) writes:

> The art of teaching as applied in the common school comprehends all of the means by which the teacher sustains the attention of his class. By attention, we do not mean the mere absence of noise and trifling; or that inert passive state in which the class, with eye fixed on the teacher, it may be, given no sympton of mental life; not that intermittent and almost unconscious attention bestowed on some casual topic which strikes their fancy; not the partial attention given by a few who may be in the immediate meighborhood of the pupil addressed. The only satisfactory attention is that which is given voluntarily and steadily by all during the entire instruction, and in which the mental attitude of the class is actively engaged along with the teacher in working out their own instruction.

The question is: Can we push past this kind of conception of what method is to achieve and, in so doing, attain a different kind of understanding than we now have of the nature of teaching and its relationship to the curriculum.

Let me approach this goal by attempting a translation of the kind of concern I see Currie expressing into more abstract terms. Instead of talking, as he does, of "the means by which the teacher sustains the attention of his class", let us invoke the notions of the teacher's work and the student's work and ask what goes into this?

The student's work in the school is learning. Let me make the assumption that for most students the act of learning is not complicated provided that they do in fact apply themselves to the tasks at hand. This assumption permits us to claim, following Carroll (1963), that perhaps the key variable in the conceptualization of the problems and possibilities in an instructional situation is the amount of time that students do in fact spend, and need to spend to learn particular units of content. Concomitantly it implies that the prime task of the teacher is to create an instructional regimen which maximizes the proportion of time students spend on-task to the time allocated to a given subject or unit of content. In this relationship between allocated time and time-on-task we have a measure of efficiency of the classroom.[1]

These terms permit us the, I believe, to understand the thrust of Currie's prescription and the source of his concern for attention. And inasmuch as are able to equate attention with time-on-task we see Currie positing that the primary yield of method, and the fundamental problem of those who are concerned with the design and development of instructional procedures (as Currie was) is with teaching methods that do in fact lead to an optimization of the time students spend in curriculum-appropriate activity. This is, as the research results I outlined in the first pages of this paper suggest perhaps a more complex problem that it would seem to be a first blush. Teachers differ, it seems, in their ability to create conditions in which the energies of their students are focussed on

task and, perhaps more important, differing organizations of the classroom also seem to differ in the potentiality for maximizing the most efficient on-task behavior of their students. It is this last point which is crucial, I believe, for our understanding of the potential of the classroom as a place in which our conceptions of education might be actualized.

It has been noted many times by many different observers that there has been comparatively little change in the apparent forms of classroom organization since the beginnings of this century. This fact should alert us to what seem to be a significant possibility, that when we talk of the classroom and classroom procedures we may be too often continuing to explore possibilities that inhere in a space that has changed little in its essentials for perhaps much of the century that public education as we know it has existed. (Westbury, forthcoming) It might also be that too much of what we have espoused about the most desirable forms of education has in fact thrust against the dominant technological and structural forms of the classrooms in which the work of the school is done. Thus, a classroom is a place designed to take prescribed numbers of students, it is provisioned in particular ways to permit the work that the system expects of the place to be done, not necessarily to support what a particular teacher might require to implement his/her conceptions of what he/she might want to do. Goals for teaching are to a significant degree set outside the classroom and so inevitably dictate what might be undertaken. And forms can persist long past their time of purposeful origin because they are what the people who man the setting know and are confortable with. As Lortie (1974) has observed, teachers develop their understandings of what teaching consists in from their own school experience and, in this sense, the school recapitulates itself by way of those who return to it (and stay) as teachers. We can see indications of what this might mean in findings such as those recently reported by Rosenshine (1976,1977): direct instruction of the kind that nineteenth century masters and mistresses of method like Currie developed and advocated still functions

more effectively than do other methods in our later-day versions of their classrooms.

The critical point implicit in this observation is, of course, the possibility of a mismatch between the forms we have for teaching (i.e. instruction) and our conceptions of what the schools could and might be doing. This kind of awareness lies behind the findings and reflections. That arrive from studies by Cusick et al (1976) of what students do in American secondary schools. They observed that one of the pervasive features of the classrooms they observed was the extent to which it seemed that students seemed to have very little to do, a result, they suggest of the ways in which teachers structure their work. They suggest that the roles that they saw teachers and students performing were the results of three assumptions:

> (1) that knowledge is compartmentalized: (2) that teachers are subject matter specialists within these various compartments, and (3) that the ideal way to pass on knowledge is to place thirty or so students in a room with a teaching specialist and have that specialist verbalize the intricacies of the speciality. When these assumptions are operationalized, the result was that teachers did almost all of what there was to do, the talking, inquiring, gesticulating, and of course, this reduced the amount of activity available for students. . . This whole process demanded a large amount of teacher attention to maintenance and supervisory matters. In fact, we suggested that the teachers frequently spent more energy supervising the 24 or so observers than in interacting with the single respondant. This whole process demanded a large amount of teacher attention to maintenance and supervisory matters which detracted form the instructional processes and exaggerated the importance of compliance with maintenance demands for the students. (pp. 5-6)

The implication of these observations would seem to be that if the energies of students could be better focussed on their learning tasks their learning (in

the broadest sense) could be maximized. The problem is that there seem to be constraints associated with the structures, technologies and goals of the conventional classroom which make it difficult to raise students' attentions beyond certain limit. One part of the constraining circumstances are clearly teacher and school expectations about their transmission-of-knowledge function; another part is associated with what Woods (1976) has called the fakery that is so much teaching, "shaped and fashioned by much experiment and usage over time to seem like a genuine product, but in reality a preserver of the teacher's neck and sanity" (pp. 30-1). But in all of this I believe that the key element is the inability of the forms that teachers know and the places in which they work to offer ways that permit teachers to seriously engage the majority of their students in any real way in their own learning.

Traditional instructional research has, of course, recognized this possibility with its attempts to discover and diffuse among teachers and awareness of the range of possibilities that inhere within traditional method. (see, for example, Rosenshine, 1971). However, as Nuthall (1974) has observed the yield of such endevors has been slight and has not yielded much more than conventional wisdon, And any exclusive focus on increasing the effectiveness of conventional methods faces the possibility that those methods cannot in fact deliver an array of curricular goals that are inconsistent with the assumptions of the methods. Unfortunately too much instructional research has eschewed the possibility of undertaking the systematic study of new methods to deliver new goals and, in so doing, has left teachers at the mercy of their own capabilities, the constraints associated with their own understanding of method, and the frames of their settings.

In the context of this claim it is revealing to compare the results of research of teaching of the traditional kind with that which has as its focus the problem of the management of instruction. If we take the goal of maximizing achievement of a conventional kind we find that mastery learning approaches

(Bloom, 1976) are much more effective than are conventional approaches, a result, I suspect, of the control of student learning which the addition of systematic feedback into the classroom gives both teachers and students. Formative tests permit both teachers and students to allocate their time and attention in a optimal way to skills and contents specified in the curriculum with which they work. (Wilkof 1976).

But mastery learning in the conventional sense only manipulates one variable in the classroom setting. Our study of PI suggests another approach to the task of classroom redesign, one that is in many senses analogous to that represented by the movement to "open" methods. PI and the open classroom achieve their efficiency, I would suggest, by decentralizing the information presentation and skill-practice channels which in the conventional classroom are monopolized by the voice of the teacher; when such channels are decentralized, students are given somewhat independent access to the sources of the content they must work on. In such environments the attention-securing problems that Currie was concerned with and the Cusick et al noticed as a pervasive feature of the classroom assume a new character. Instead of facing the problem of optimizing the capacity of a single channel (the teacher), the instructional designer and the classroom teacher micro-environments with their supporting materials which can offer different students access to contents and skills and develop ways in which the teacher as over all manager of the classroom group can monitor what each child does. (For a perceptive study of the problems of the management of such classroom environments see Berlak and Berlak, 1977)

It is when we consider the potentials of existing classroom forms for truly individualizing instruction that the limits of these forms become apparent. It would seem that a demand for more effective control of students in the individualized classroom (and also in the conventional classroom) leads to a press for more intensive manning of the setting by teachers. However this solution raises its own problems of cost. And, given the probability that the costs of education

cannot be assumed to be able to increase significantly at this time, instructional research has to focus on ways in which attention vis-a-vis their learning tasks can be focussed and raised by mechanisms other than the increasingly costly teacher.

It would seem that the computer may be a mechanism that can play a significant role in solving this problem but as I read the literature on computer-assisted instruction there seems to be a near-total ambiguity about what the computer is supposed to do in instruction in the public school. (see, for example, Bunderson and Faust, 1974). The terms I have been exploring today would seem to provide the missing links in the argument for the potential of CAI -- the computer would seem to have potential for offering classrooms a second interactive channel that students can use for thier learning. The fundamental questions that would seem to face CAI then become, given this view of what the computer might promise the schools: (1) whether meaningful contents and skills can be programmed into CAI systems? (2) what are the effects on the introduction of such a new medium on our understanding of the potentialities of the classroom? (3) does the presence of a second, potentially dynamic, channel have significant effects on the on-task behavior of students? and (4), given positive answers to each of the above, what are the cost-benefits of the capital-labor trade that is part and parcel of the use of such an input channel as the computer? Is the computer in fact more cost effective than such simplier non-interactive mechanisms as ditto-paper worksheets?

The potential availability of the computer does not, of course, exhaust the array of possibilities for changing the forms of the school once we understand what the tasks of instructional research and design might be, that of permitting and encouraging teachers and students to deploy their resources of time and attention more effectively vis-a-vis the educational tasks of the school. Martin (1977) as described a quite different approach to this same problem: the program he observed adopted a variety of strategies designed to form a new social group composed of both teachers and students. It was the purpose of this group to

develop a reward system and a system of normative behavior which valued high student involvement and academic achievement. . .the staff and students initiated a set of periodic 'learning expeditions' in which the entire group would, intermittently throughout the year, spend a week backpacking, camping, canoing. During and before each trip, the students conducted field studies in history and science and wrote research papers and poetry connected with the direct first-hand experiences gained on the trip. Preparations for the expeditions were made by all the students and teachers, and the planning and organizing tasks proved sufficiently complex to involve almost all students. (Cusick et al, 1976, p. 10)

The thrust of this program is of course amenable to the terms I have been developing in this paper. The program was intended to improve the school experienc of a group of students who has been identified as "problems" because of apathy, vandalism, and delinquency. By creating an environment which heightened the work-emotionality of the group, there was a concommitant increase in involvement and achievement in conventional academic terms. But at the same time the program with its expeditions and their related organization problems and group interdepende offered a different kind of education for its students and offered the school (through its teachers) a different kind of power relationship over the students:

> Teachers accumulated power through this process and became informal as well and formal leaders. They developed legitimate authority which, judiciously applied, enabled them to exert unusually strong influence on the behavior of their students. Teachers sustained their leadership by distributing responsibility among students, by effectively counseling individuals, and by resolving group problems. (Martin, 1977, p. iii)

I am not necessarily advocating the desirability of kind of power and influence relationships that emerged from the program Martin described. Nor am I endorsing as an exclusvie goal for the school the kind of learning as information-transmission that I have been discussing implicitly thoughout this

paper. I have used examples drawn from this tradition only because the possibility of different instructional forms than those we now have readily available is perhaps easier to see in this context than they are in a discussion that seeks to explore in more open ways both problems of complex ends and their related problems of means. Other conceptions of the tasks of the school as an educative milieu are possible, indeed absolutely necessary, but as Schwab (1954), Barnes (1976) and Barnes and Todd (1977) show by implication, the design of settings in which other kinds of ends might be sought and achieved is a complex task. And the description of such settings as they emerge in the hurly burly of the school strains to breaking point our languages for conceptualizing and discussing teaching. In the context of this kind of problem, my goal today has been a simple one -- to show, on the one hand, how a concern for curricular problem leads one inexorably into the mechanics and dynamics of the classroom and, on the other, that a concern for the classroom without a concern for context poses the danger that the questions that will arise are, from the viewpoint of the schools, wrong questions.

FOOTNOTES

1.2 Berlak and Berlak (1977) note that American educator are more concerned than are English about the 'industry' of their students. Let me acknowledge this but argue that the notion that I am outlining here is culturally-neutral: To some asymptote set by a culture there is in the conventional classroom considerable variance in the time students spend working, variance which is problemtic even with the parameters set by a particular culture.

REFERENCES

Arlin, M.N., Rate and Rate Variance Trends under Mastery Learning. Ph.D. Dissertation, University of Chicago, 1973.

Arlin, M.N. & Westbury, I., "The Leveling Effect of Teacher Pacing on Science Content Mastery", Journal of Research in Science Teaching, 13 (1976), pp. 213-19.

Barnes, D., From Communication of Curriculum. Harmondsworth: Penguin Books, 1976.

Barnes, D. and Todd, F., Communication and Learning in Small Groups. London: Routledge and Kegan Paul, 1977.

Berlak, A., and Berlak, H., The Dilemmas of Schooling St. Louis, MO.: Webster College, 1977 Unpublished manuscript.

Bloom, B.S., Human Characteristics and School Learning. New York: McGraw-Hill, 1976.

Bunderson, C.V. & Faust, G.W., "Programmed and Computer Assisted Instruction." In The Psychology of Teaching Methods. The 75th Yearbook of the National Society for the Study of Education, Part I (edited by N.L. Gage) Chicago: The Society, 1976, pp. 44-90.

Carroll, J.B., "A Model of School Learning," Teachers College Record 64 (1963): 723-33.

Currie, J., The Principles and Practice of Common-School Education, Cincinnati: R. Clarke, 1884.

Cusick, P., Martin, W., & Palonsky, S., "Organizational Structure and Student Behavior in Secondary School", Journal of Curriculum Studies 8 (1976), pp. 3-14

Filby, N.N. Marliave, R.S., & Fisher, C.W., Allocated and Engaged Time in Different Content Area of Second and Fifth Grade Rating and Mathematics Curriculum. Paper presented to annual meeting of the Educational Research Association, New York, 1977, (San Francisco. CA: Far West Laboratory for Educational Research and Development).

Good, T.L., Grouws, D.A., & Beckerman, T.M., "Curriculum Pacing: Some Empirical Data in Mathematics." Journal of Curriculum Studies, in press.

Gump, P.V., "What's happening in the elementary classroom:" In Research into classroom processes. (Edited by I. Westbury and A.A. Bellack.) New York: Teachers College Press, 1971.

Lortie, D., School-teacher. Chicago: University of Chicago Press, 1974.

Martin, W.H., A Participant Observation Study of an Outdoor Education/Experiental Curriculum Experiment Operating in a Public Secondary School. Ph.D. dissertation, Michigan State University, 1977.

Nuthall, G., "Is classroom interaction research worth the effort involved?" New Zealand Journal of Educational Studies, 9.1, 1974.

Rosenshine, B., Teaching Behaviors and Student Achievement. Slough; National Foundation for Educational Research in England and Wales, 1971.

Rosenshine, B., Direct Instruction. In The Psychology of Teaching Methods, the 75th Yearbook of the National Society for the Study of Education, Part I (Edited by N.L. Gage). Chicago: the Soceity, 1976, 335-71.

Rosenshine, B., Primary Grades Instruction and Student Achievement Gain. Urbana IL.: Bureau of Educational Research, University of Illinois at Urbana-Champaign, 1977. Unpublished paper.

Rothkopf, E.Z., "Two scientific approaches to the management of instruction." In Learning Research and School Subjects. Eighth Annual Phi Delta Kappa Symposium on Educational Research (Edited by R.M. Gagné and W. J. Gephart) Itasca, IL.: F.E. Peacock, 1968, 107-31.

Rothkopf, E.Z., Writing to Teach and Research to Learn: A Perspective in the Psychology of Written Instruction. In The Psychology of Teaching Methods. The 75th Yearbook of the National Society for the Study of Education, Part 1 (Edited by N.L. Gage). Chicago: the Society, 1976, pp. 97-129.

Schwab, J.J., "Eros and Education", Journal of General Education, 8 (1954), 54-71.

Westbury, I., "Curriculum, A search for ends and means," In Rethinking Educational Research, (edited by W.B. Dockrell and D. Hamilton). London: Hodder and Stroughton, forthcoming.

Wilkof, N.J., Feedback in Teaching, Urbana, IL.: University of Illinois at Urbana-Champaign, Department of Secondary Education, 1976. Unpublished paper.

Woods, P., Teachers' Objectives: the Survival Element. In School Experience (Edited by P. Woods and M. Hammersley). London: Croom Helm, 1977, pp. 271-93.

Table 1

Engagement Rates in Mathematics

for Grade 2 Students*

Engagement Rate	Number of Students						
	Overall	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
0-9%							
10-19%							
20-29%	7					7	
30-39%	27	6		5	3	11	2
40-49%	32	6		11	2	5	8
50-59%	16	2	1	4	2	3	4
60-69%	14	1	4		7		3
70-79%	11	1	8				1
80-89%	3		3				
90-100%	2		2				
Mean		47%	74%	44%	54%	37%	51%

The observed engagement rate was calculated by taking the ratio for each student of engaged time in mathematics (direct observation) and allocated time in mathematics (observer logs).

*From N. N. Filby, R. S. Marliave, and C. W. Fisher, Allocated and engaged time in different content areas of second and fifth grade reading and mathematics curriculum. Paper presented at annual meeting of the American Educational Research Association, New York, 1977 (San Francisco: Far West Laboratory for Educational Research and Development, 1977).

Table 2

PERCENTAGE OF PUPIL OCCUPANCY

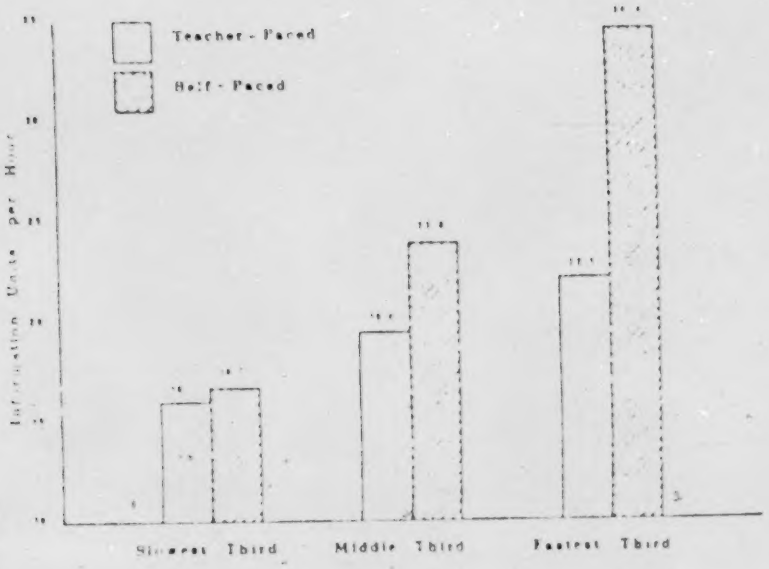
TIME SPENT IN SEGMENTS OF VARIOUS CONCERNS

CONCERN	MEAN	LOW	HIGH
Academics	72	65	83
Music, Art	7	2	13
Social, Recreational	7	4	12
Procedure	12	7	16
Other (Ritual Group "Talks")	2	trace	8

NOTE: Each "Low" and "High" represents a classroom average for two days of observation.

From P. V. Group, "What's Happening in the Elementary Classroom. In Research Into Classroom Processes (Edited by I. Westbury and A. A. Bellack). New York: Teachers College Press, 1971, p. 162.

Figure 1. Mean learning rates of slowest, middle, and fastest thirds of students under two two types of pacing (N=60; 10 per sub-group)*



* From M.N.Arlin and I.Westbury, "The Leveling Effect of Teacher Pacing on Science Content Mastery," Journal of Research on Science Teaching 13(1976)

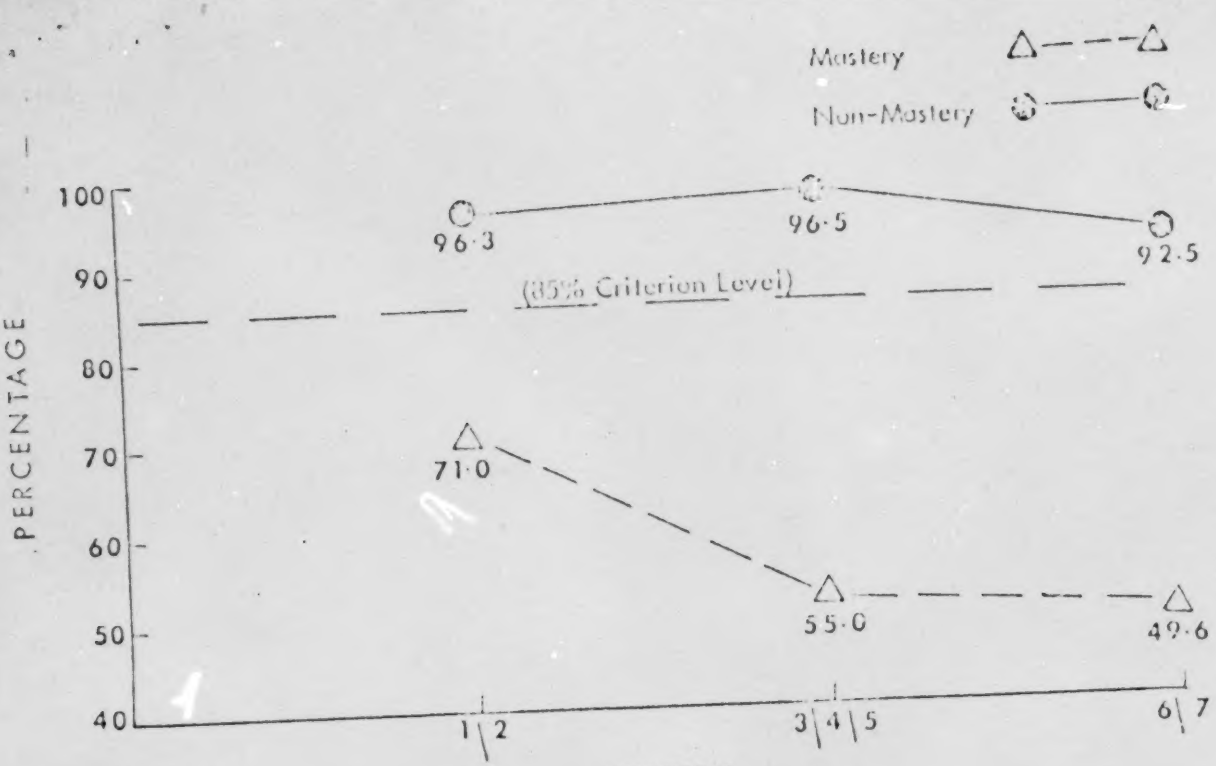
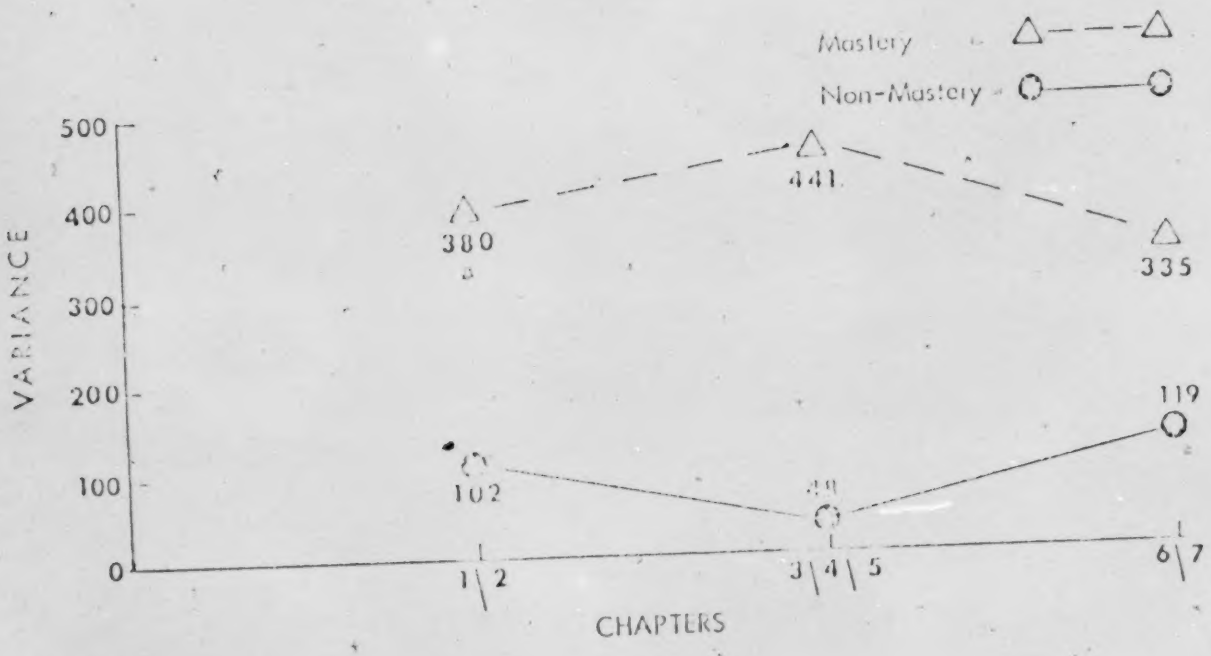


FIGURE 2

FINAL ACHIEVEMENT LEVEL



From M.N.Arlin, Rate and Rate Variance Trends under Mastery Learning.